Jury Report
Dutch Price for ICT Research 2023

De ICT-Prijs is ingesteld door het Informatica Platform Nederland waarin alle instituten van Nederland die wetenschappelijk onderzoek doen in de verschillende onderdelen van de informatica zijn verenigd. De prijs wordt dit jaar voor de twaalfde keer uitgereikt. NWO heeft de prijs vanaf het begin gesponsord, waarvoor de IPN zeer erkentelijk is. Vanaf dit jaar wordt de prijs opgebracht door een bijdrage van alle instituten verenigd in IPN aangevuld met een bijdrage van COMMIT. Als tevoren heeft de IPN de Koninklijke Hollandsche Maatschappij der Wetenschappen gevraagd de beoordeling te doen verrichten opdat onafhankelijkheid van oordeel is gewaarborgd.

De prijs wordt toegekend aan "een wetenschappelijk onderzoeker, met een wetenschappelijke leeftijd van maximaal vijftien jaar, die vernieuwend onderzoek op zijn/haar naam heeft staan of die verantwoordelijk is voor een wetenschappelijke doorbraak in de ICT" en "Bij de selectie zal worden meegewogen of de onderzoeker getoond heeft in staat te zijn de behaalde resultaten in begrijpelijke taal aan het publiek duidelijk te maken."

Het verheugt de jury dat de prijs leeft. Dat wordt benadrukt door het grote aantal van 7 inzendingen dat de jury heeft toegelaten tot de beoordeling.

De winner of the Dutch Price for ICT Research 2023 is:

Dr. Cristiano Giuffrida, Vrije Universiteit Amsterdam

The jury was struck by the high quality of research of the nominees. Another good sign is the fact that the nominees cover a broad range of subdisciplines in the field of informatics. In their young and developing careers, all nominees have achieved a sizeable impact in their respective international communities.

The winner comes from the field of computer security. Ministers are woken up in the middle of the night to inform them of a large-scale security breach in computer systems. Universities lose millions of Euros after being ransacked digitally or narrowly escape such attacks. Countries and companies have large divisions defending their computer security. Other subdisciplines of informatics also enjoy intense public attention, but security surfaces only when there is something wrong. No one doubts the importance of the field of security to society.

Societal importance matters, but it is not the main topic today. Societal importance is not the reason why the winner was selected. It is the science that matters. And exceptional scientific qualities he has. The science of computer security is the art to doubt the existing, the challenge of the commonly accepted safety of standard solutions, the cracking of a hole in the shell of defense in computer systems, finding a way around fundamental obstacles where no one has gone before. The fundamental question is: "What are ways to modify computer instructions and/or computer data into something with a different purpose?" In the field of data and instructions that have been tricked into meaning something else, theory and experiment go hand in hand. And the winner has found ways of performing

actions and doing experiments that were never thought of before, or even imagined to be possible. The winner excels in both sides of security: in the theoretical and in the experimental side of this (bit)coin. He has been extra-ordinarily productive over the previous 5 years. At his young age, he appears in the top 20 of most productive researchers in the field of security. More importantly, the papers received high numbers of citations for the subfield of computer systems. And more importantly still, with these papers, the winner has won plenty of scientific prizes.

At the start of his career, the Special Interest Group of the ACM - his peers in the field of computer systems - have selected Cristiano Giuffrida for the best PhD-thesis award for computer systems research in Europe. And the same thesis was awarded the ACM award for the best PhD-thesis in the field of computer systems worldwide as well. Today, it is the only PhD-thesis ever to win both awards. It did not stop there. The list of awards is much, much longer, but in 2021 alone, the winner received two best paper awards at major conferences. In addition, he also won the best practical paper award at the top-conference in 2019 and 2020, two years in a row.

It is hard to decide which one of these four awards is more relevant, but his work has directly led to major repairs in the software that controls the operation of chips in general. In other words, it applies to all programs for all purposes of all millions and billions of copies of that chip. The key here is that the method is so universal that even general browser software can be manipulated to breach the security, with an enormous impact. As soon as Cristiano Giuffrida's new ways of circumventing security from very common software surfaced, the alarm was sounded and a massive reaction for both hardware and software design followed. No need for impact analysis, we all can see it.

Even if the winner did not seek publicity per se, he did get his immediate share. From the front page of Dutch newspapers to the international press, they all were alerted. Like in many other fields in computer science, what we do is obscure to most people but these results felt to be of vital interest, so it is important to answer the call when the public wants to be informed. The winner has contributed to that by publishing not only papers but also his software as open source.

In the originality of the work, in his exceptional scientific impact, in the very large stream of awards, and in his sustained contribution to the public cause lies the motivation of the jury to grant Cristiano Giuffrida the ICT Prijs 2023.

Prof. dr. M.J.G. (Michel) van Eeten, hoogleraar cybersecurity Technische Universiteit Delft
Prof. dr. ir. A.W.M. (Arnold) Smeulders, hoogleraar computer vision Universiteit van Amsterdam, voorzitter directie COMMIT
Prof. dr. L.C. (Rineke) Verbrugge, hoogleraar logica en cognitie Rijksuniversiteit Groningen

The jury met on January 25, 2023 under the leadership of KHMW-treasurer Mr. R.J. (Rutger) Schimmelpenninck, in the presence of Prof. dr. A.P. (Ad) IJzerman, secretary for natural and medical sciences, KHMW.